

Remarks/Arguments

This paper accompanies a Request for Continued Examination and responds to a final office action mailed May 11, 2006. Reconsideration of the application in light of the accompanying remarks and amendments is respectfully requested.

The present application is drawn to the shaft of a surgical instrument, and specifically to the structure of the shaft which is well illustrated in Figures 3A and 3B. The shaft is formed of alternating beads which contact each other along lines of contact (LC) defined between convex surfaces of the adjacent beads. This line contact, which is present even when the shaft is bent, minimizes friction between adjacent beads. This results in a shaft which remains very flexible, even when the beads are under compression. This can happen, for example, when the shaft is incorporated into a clamp device. In such a device, when the jaws of the clamp are closed, for example on a blood vessel of a patient, the flexible shaft allows the handle of the device to be bent out of the way. The flexible shaft of the present invention allows this bending to be done with less torque being transmitted to the blood vessel. This is discussed at length in the specification, for example at page 6, lines 9-26.

The claims as previously pending called for this structure and had been rejected by the Examiner based upon US 6,019,722 to Spence (hereafter "Spence") and US 6,019,722 to Cosgrove (hereafter "Cosgrove"). The claims herein have been amended to even further highlight the inventive structure, and these claims are patentable over the art of record.

Each of independent claims 50, 56 and 61 calls for line contact between the beads of the shaft, and for the beads to have a convex shape at the line of contact. The Examiner had previously held that Spence showed such a configuration. Reconsideration of this holding is respectfully requested.

First, it is believed necessary to point out that the "partial enlargement" of Fig. 7a of Spence which was supplied by the Examiner on page 2 of the May 11, 2006 Office Action contains subject matter which is not at all present in actual Fig. 7a from Spence. Specifically, the concave curve of element 92 shown in the partial enlargement has been drawn by the Examiner to be curved more sharply than the surface of bead 90. Nothing in Spence shows or describes such a structure. Applicant respectfully urges the Examiner to rely upon the actual drawings from the prior art.

Turning to Spence, this patent discloses a shaft which is made of alternating members, and wherein elements 92 have surface contact with elements 90. The surface contact is defined by matching concave and convex surfaces, with the outer bead having a concave surface at the surface of contact. This fails to meet the requirements of the present claims because (1) contact is not at a line of contact, and (2) the outer element 92 does not have a convex shape at a line of contact with element 90. If the Examiner's point with the enlarged view was to show that the corners of element 92 are convex, while this may be true, these are not points of contact with element 90. Rather, as soon as the convex corners of element 92 begin

to turn away from element 90, they are no longer in contact with element 90.

It is also noted that prior to this response, dependent claim 55 called for the second beads to contact the adjacent first beads along a line of contact. The Examiner asserted that Fig. 7a of Spence shows line contact, but it is not at all understood how the Examiner believes this to be so. Elements 90 of Spence clearly contact elements 92 along a surface of contact defined by mating convex and concave surfaces.

The Examiner at page 3 appears to acknowledge that the surfaces of Spence do not actually meet the claimed structure, but nevertheless states that the claimed structure would have been an obvious design choice since "such a design does not solve any stated problem". The Examiner's attention is respectfully drawn to the above cited excerpts of the present patent specification which clearly explain advantages of the line contact of the present invention.

Based upon the foregoing, it is submitted that independent claims 50, 56 and 61, each calling for line contact as explained above, are clearly neither disclosed nor obviated by Spence.

As to claim 61, the Examiner concedes that base reference Cosgrove as applied to that claim does not show the beads of the present invention, but rather relies upon Spence for this teaching. Spence fails in this regard, as set forth above, and claim 61 is therefore patentable over the art of record.

New independent claim 68 has been added and presents the subject matter of the present invention related to

alternating beads forming a flexible shaft and contacting each other along lines of contact in a different scope of claim. This claim is believed allowable over the art of record for reasons noted in connection with claims 50, 55 and 61 above.

The Examiner also entered a double patenting rejection based upon claims 1-7 of US 6,638,287. It is submitted that claim 1 of the '287 patent calls for a rigid element (col 17, lines 3-6) which is not present in the pending independent claims, and therefore that a double patenting rejection in this instance is not proper. Nevertheless, and without conceding obviousness as between the claims of the '287 patent and the present application, Applicant will file a terminal disclaimer upon indication of otherwise allowable claims.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.


It is submitted that the claims as amended herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

A Request for Continued Examination and a request for 3 month extension of time accompanies this paper and contains an authorization to charge the requisite fee to a deposit account. Please also charge the fee for one

additional independent claim (small entity, \$100) to
Deposit Account 02-0184.

It is believed that no further fee is due in
connection with this paper. If any fee is due, please
charge same to Deposit Account No. 02-0184.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States
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"Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on November 13, 2006


George A. Coury